

Missouri Department of Natural Resources

## Total Maximum Daily Load Information Sheet

### Trace Creek

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#### Waterbody Segment at a Glance:

**County:** Madison  
**Nearby Cities:** Fredericktown  
**Length of impairment:** 1.0 miles  
**Pollutant:** pH  
**Source:** Natural



State map showing location of watershed

**TMDL Priority Ranking:** TMDL Approved 2004

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#### Description of the Problem

##### Beneficial uses of Trace Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption

##### Use that is impaired

- Protection of Warm Water Aquatic Life

##### Standards that apply

- Missouri Water Quality Standards for pH found in 10 CSR 20-7.031(3)(E) state that water contaminants shall not cause pH to be outside of the range of 6.5-9.0 SU (Standard Units).

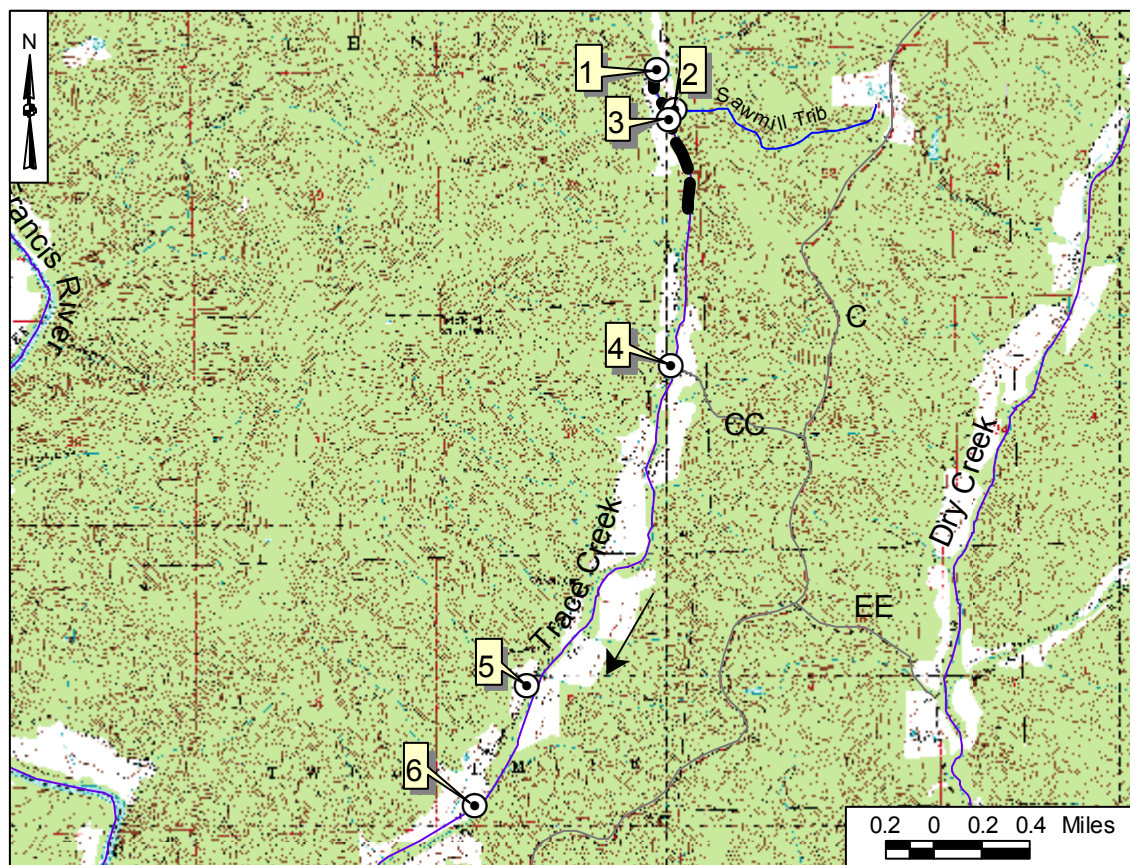
#### Background Information and Water Quality Data

Trace Creek flows through a heavily forested watershed south of Fredericktown. Much of the bedrock in the upper portion of the watershed is igneous (volcanic) rock, which does not neutralize acidic rain (rain water in this part of Missouri has an average pH of about 4.7 SU). As a result, this portion of Trace Creek is often too acidic (low pH) to meet state water quality standards. This acidity problem was aggravated in the early 1990s by a discharge to Trace Creek of leachate from a sawdust pile. One set of samples in 1993 showed a pH of 3.9 in the tributary to Trace Creek carrying the sawdust pile leachate, a pH of 5.2 in Trace Creek above this tributary and a pH of 4.7 one mile below this tributary. After measures were taken to deal with the sawdust leachate problem, monitoring data shows that pH levels in Trace Creek downstream of the leachate tributary meet state standards (see Graph 2). As a result, the sawdust pile leachate was dropped from 303(d) list as a source and the length of impairment was reduced to one mile.

The TMDL examines several possible sources of acidity and concludes that the principal source in Trace Creek is unbuffered acid rain. This rain is partially attributable to sulfur dioxide emissions from the Glover Smelter, which is 36 miles southeast of the creek. Since this smelter closed December 2003, it is assumed that the precipitation will be less acidic. Future monitoring of the creek should determine whether this is true or not.

Since pH is not a concentration, a daily maximum load cannot be calculated. Therefore, the endpoint for the TMDL is simply that there shall be no deviation from the pH standard of 6.5-9.0 SU. The U.S. Environmental Protection Agency approved the TMDL on November 15, 2004. Graphs summarizing the data may be found below on the next page.

### Impaired Segment of Trace Creek in Madison County, Missouri, with Sampling Sites

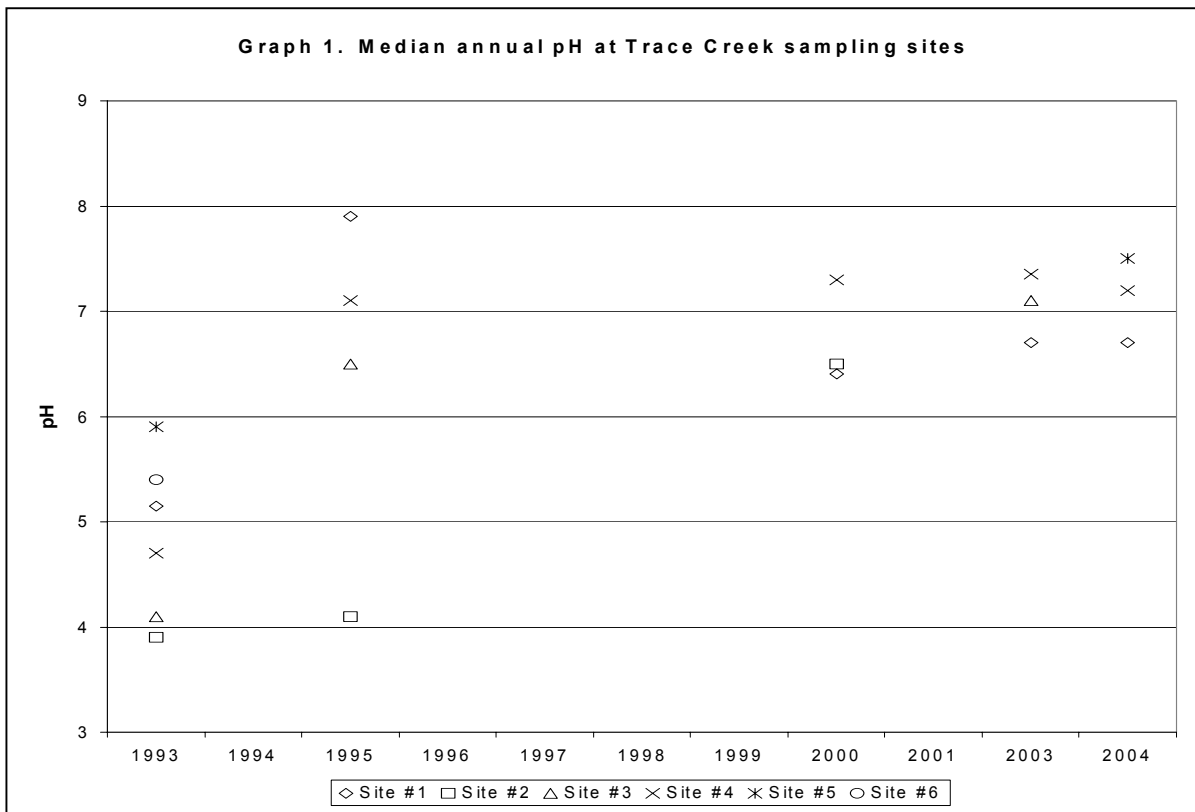


— — — — — Impaired Segment

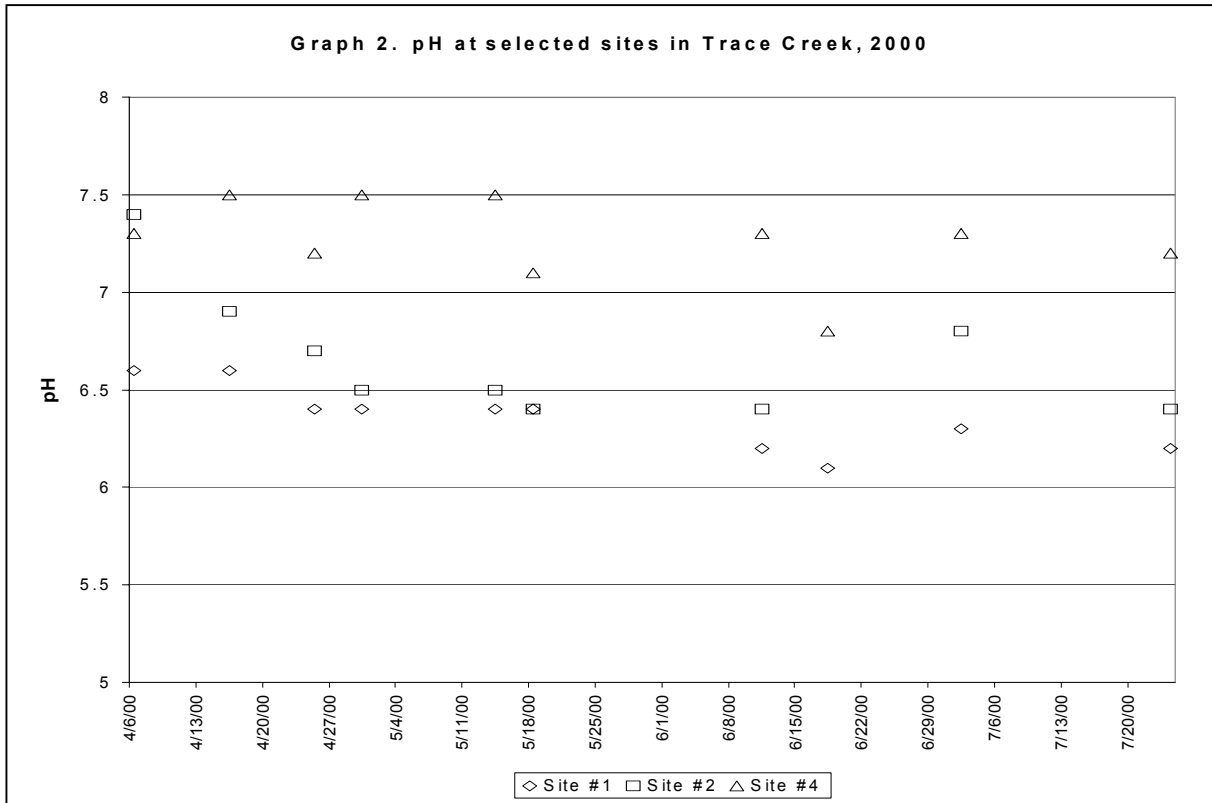
—————> Direction of Flow

#### Site Index

- 1 – Trace Creek 0.1 mile above Sawmill Tributary
- 2 – Sawmill Tributary 0.1 mile above mouth
- 3 – Trace Creek just below Sawmill Tributary
- 4 – Trace Creek 1.1 miles below Sawmill Tributary
- 5 – Tributary to Trace Creek 2.5 miles below Sawmill Tributary
- 6 – Trace Creek 3.1 miles below Sawmill Tributary



Source: Mo. Dept. of Natural Resources, Missouri Dept. of Conservation



Source: William Jud (Geologist) See next page.

The graph above presents data from a special study of the pH coming from the sawmill site. Ten sets of data were collected from April through July 2000. Median pH values for these measurements were: pH of 6.4 in Trace Creek upstream of this tributary (Site #1), pH of 6.5 in the tributary from the sawdust pile (Site #2) and pH of 7.3 in Trace Creek one mile downstream of this tributary (Site #4). Note that all but two of the samples collected *upstream* of the tributary (Site #1) are below water quality standards (pH of 6.5 to 9).

**For more information call or write:**

Missouri Department of Natural Resources

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